What is claimed is:

1. A Vestigial Sideband (VSB) transmission system comprising:

a supplemental data processor processing input supplemental data including encoding, inserting a null sequence, and inserting an MPEG header;

a multiplexer multiplexing said supplemental data processed in said supplemental data processor and MPEG data;

a first encoding part processing said multiplexed data including data randomizing, adding a first parity, data interleaving, and byte-symbol converting;

a second encoding part encoding said data processed in said first encoding part with a 1/N coding rate if said first encoding part receives said supplemental data from said multiplexer, N being a natural number;

a decoding part processing said data encoded in said second encoding part including symbol-byte converting, data deinteleaving, and eliminating said first parity added in said first encoding part; and

a VSB transmitter processing said data processed in said decoding part including trellis encoding, adding a second parity, data interleaving, VSB modulating, and transmitting to a receiving side.

2. The VSB transmission system of claim 1, wherein said second encoding part is a 1/2 rate convolutional encoder.

3. The VSB transmission system of claim 2, wherein said second encoding part convolutionally encodes information bits of said supplemental data with a 1/2 coding rate in order to produce a parity bit and outputs non-coded information bits and said parity bit to a trellis encoder of said VSB transmitter as an upper and lower input bits.

4. The VSB transmission system of claim 1, wherein said second encoding part includes:

a first selecting element selecting a first register value stored in a first register when said supplemental data are received and otherwise selecting a second register value stored in a second register;

a first register storing said selected value in said first selecting element for a first predetermined period;

an adder adding said stored value in said first registered and an information bit of said supplemental data;

a second selecting element selecting a said added value when said supplemental data are received and otherwise selecting said second register value stored in said second register;

a second register storing said selected value in said second selecting element for a second predetermined period; and

a third selecting element selecting said value stored in said second register when said supplemental data are received and otherwise selecting a lower input bit.

5. The VSB transmission system of claim 1, further comprising a supplemental data symbol indicator determining whether said first encoding part receives said supplemental data from said multiplexer and providing a corresponding control signal to said second encoding part.

6. The VSB transmission system of claim 5, wherein said supplemental data symbol indicator assigns a flag bit for each byte of data received from said multiplexer, sets flag values based on the type of said received data, inserts each parity flag, performs data interleaving and byte-symbol converting processes, and generates a corresponding control signal.